Subscriptions for 1942 are now due

ENTOMOLOGICAL NEWS

FEBRUARY, 1942

Vol. LIII No. 2

CONTENTS

Franclemont—Notes on Some Cucullinae (Phalaenidae, Lepidoptera) II 31
Harris—The Male of Pagasa fasciventris H. M. Harris (Hemiptera: Nabidae) 36
Satterthwait—Weevils (Coleoptera, Curculionidae) Affecting Chufa (Cyperus esculentus) 37
Blaisdell—Notes Concerning Eschatomoxys wagneri Blaisdell (Coleoptera: Tenebrionidae) 43
Riley—Misidentified Genotypes 45
Michener—Taxonomic Notes on the Genera Chelostoma and Ashmeadiella (Hymenoptera, Megachilidae) 47
Current Entomological Literature 52
Rodeck—Colorado Lepidoptera Records (Pieridae, Noctuidae) . . . 58
Obituary—Dr. James Allen Nelson 59
Mr. Ralph Hopping, Mr. F. C. Hennessey, Dr. H. E. Ingham 60

PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES,
1900 Race Street

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 1, Act of October 3, 1917, authorized January 15, 1921.

ENTOMOLOGICAL NEWS

published monthly, excepting August and September, by the American Entomological Society.

Philip P. Calvert, Ph.D., Editor; E. T. Cresson, Jr., R. G. Schmieder, Ph.D., V. S. L. Pate, L. S. Mackey, A. G. Richards, Jr., Ph.D., J. W. H. Rehn, Associate Editors.

Subscription price, U. S. Currency, per year of ten (10) numbers: United States, Central and South America $3.00, Canada $3.15, Foreign $3.30.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	1 in.,	$ 1.20,	3 in.,	$ 3.00,	6 in., $ 7.00
Ten issues,	"	8.00,	"	25.00,	" 60.00

SUBSCRIPTIONS. All remittances and communications regarding subscriptions, non-receipt of the "News" or of reprints, and requests for sample copies, should be addressed to

ENTOMOLOGICAL NEWS, 1900 Race Street, PHILADELPHIA, PA.

MANUSCRIPTS AND ADVERTISEMENTS should be sent to the editor, Dr. P. P. Calvert, P. O. Box 14, Cheyney, Pennsylvania. The receipt of all papers will be acknowledged and, if accepted they will be published as soon as possible. If not accepted, authors will be so advised and postage requested for return of manuscripts. Articles longer than six printed pages will be published in two or more installments, unless the author is willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division. Proof will be sent to authors.

Twenty-five extras (separates) of an author's contribution will be given free when they are requested; they will be "run of form," that is without removal of extraneous matter (parts of other articles at beginning and at end), folded, but unbound, uncut and without covers. Authors wishing more than 25 separates can obtain them, at the rates given at the bottom of this page, by ordering at the time of returning proof. When more than the twenty-five free separates are ordered, ALL the extras will be free of extraneous matter.

ILLUSTRATIONS will be published only when the author bears all or part of the costs as follows:

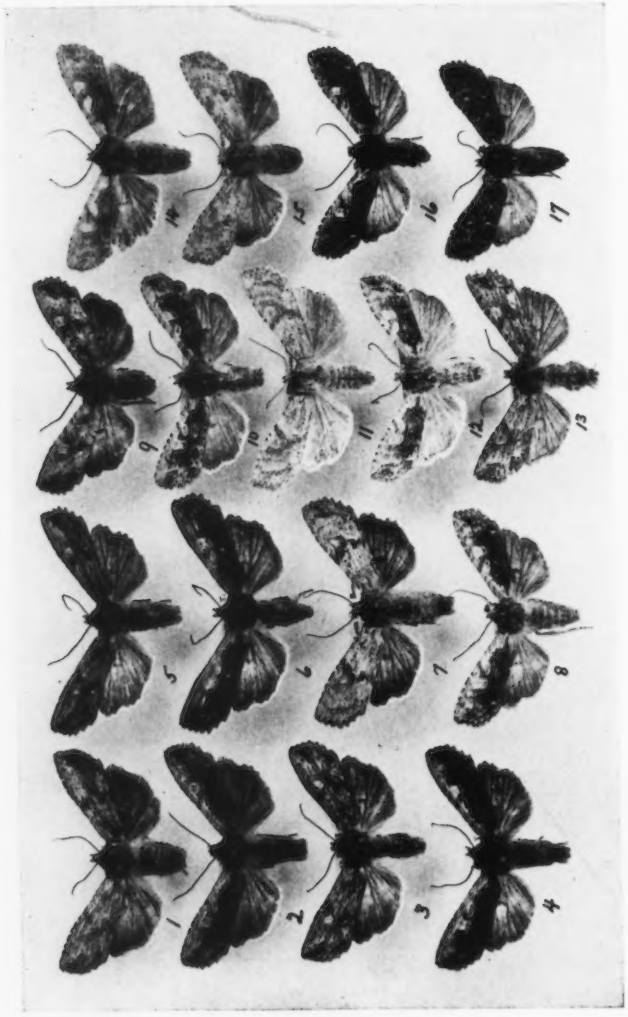
Entire cost of making blocks, which must not exceed 4 by 6 inches.
Printing full-page plates (inserts).
Proportion of cost of printing text-cuts exceeding 3 inches in height.
It is not advisable to print half-tones as text-figures in the NEWS.
All blocks will be returned to authors after publication.
Authors will be charged the cost of setting tables.
Further information on the above may be obtained from the editor.

Stated Meetings of The American Entomological Society will be held at 8.00 P. M., in 1942, on the fourth Thursday of each month excepting June, July, August, November and December, and on the third Thursday of November and December. Communications are solicited.

The printer of the "News" will furnish separates of articles, without covers, over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 65 cents; three or four pages, twenty-five copies, $1.05; five to eight pages, twenty-five copies, $1.75; nine to twelve pages, twenty-five copies, $2.35; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates up to 100 copies; over 100 copies prices on application direct to printer. Printed covers for 50 copies, $4.00 or more, according to number of pages bound.

Parcel Post charges will be added according to weight of separates.

Stamps will not be accepted in payment for Reprints



CUCULLINAE—FRANCLEMONT.

ENTOMOLOGICAL NEWS

VOL. LIII FEBRUARY, 1942 No 2

Notes on Some Cucullinae (Phalaenidae, Lepidoptera) II.

On the Identity of Lithophane ferrealis Grote and Xylina innominata Smith, with Descriptions of Some New Forms of the Genus Lithophane[1] Hübner.

By J. G. FRANCLEMONT, Ithaca, New York.

(Plate I.)

LITHOPHANE PETULCA form FERREALIS Grote (Pl. I, fig. 2). *Lithophane ferrealis* Grote, 6th Ann. Rept. Peab. Acad. Sci., 32, 1874.

This form has troubled everyone who has attempted to work on the species of the genus *Lithophane* (*Graptolitha*, ‡*Xylina*). I think that one reason has been that no one, in all probability, has had a really 'pure' series of this form, as the same color form occurs in six other species, not including *oriunda*, and there can be no doubt that this has helped to create some of the confusion which seems to have always surrounded this form. There has also always existed the doubt as to the validity of this form as a species, but no one seems to have been able to decide to which species this form should fall. As

[1] *Lithophane* was proposed by Hübner, Verz. bek. Schmett., 242, 1821; *Graptolitha* follows immediately on the same page. Grote, considering *Graptolitha* a subgenus of *Lithophane*, designated the types of both names in the Sixth Annual Report of the Trustees of the Peabody Academy of Science, 1874, on pages 31 and 34 respectively; choosing as the type of *Lithophane*, *Noctua socia* Rott. (*petrificata* D. & S.), a species very closely allied to *amanda Smith*, in fact the latter species may prove to be but a geographical race of the former; and as type of *Graptolitha*, *Noctua furcifera* Hufn. (*conformis* D. & S.), a very close ally of *pexata* Grote. Hampson's (Cat. Lep. Phal. B. M., vi, 243 and 246, 1906) division of the species he includes in *Lithophane* and *Graptolitha* is purely artificial, in fact the characters of differentiation employed are non-existent! It is proposed here to use *Lithophane* for all the species included in both this genus and *Graptolitha* by Hampson; as a result *Lithophane* will replace *Graptolitha of McDunnough's* 1938-39 Checklist, page 83.

a result the name has stood on American lists as a valid species, and this is in part traceable to mixed series.

True *ferrealis* is the suffused form of *petulca* Grote. The fore wings have the costa, reniform and orbicular ashen with a slight bluish cast; the remainder of the wing is reddish, ferruginous black. The hind wings are blackish fuscous, with the fringes ruddy. The abdomen has the lateral and anal tufts ruddy.

This form is correctly figured by Smith, Trans. Am. Ent. Soc., xxvii, pl. III, figs. 11 & 12; normal *petulca* (‡*signosa* Smith) is figured on the same plate, figure 13, also figure 4 as "*disposita*—a little suffused."

Specimens examined: 57 from New Jersey, Pennsylvania, New York, Massachusetts and Maine; Ontario and Manitoba, Canada.

LITHOPHANE HEMINA form **lignicosta** form. nov. (Pl. I, fig. 4).

The costa, orbicular and reniform of the fore wing are wood brown; the remainder of the wing is vinous black to blackish brown; the ordinary markings where visible are as in normal *hemina*.

This form differs from *ferrealis* in its generally darker color, especially that of the costa, orbicular and reniform; it also lacks the warm reddish tints of that form. The fringe of the hind wings is dark brown, not ruddy; the lateral and anal tufts of the abdomen are aslo brown.

Holotype: ♂, Ithaca, NEW YORK, Sept. 29, 1940 (J. G. Franclemont), [in Coll. Franclemont].

Allotype: ♀, Ithaca, New York, Sept. 29, 1940 (J. G. Franclemont), [in Coll. Franclemont].

Paratypes: 97 ♂ ♂, 74 ♀ ♀ Ithaca, New York, Sept-April (J. G. Franclemont); 35 ♂ ♂, 49 ♀ ♀. McLean Bogs Reserve, Tompkins County, New York, Sept.—March (J. G. Franclemont); 3 ♂ ♂, 2 ♀ ♀, Chaffee, New York, September (J. G. Franclemont); [all in coll. Franclemont]. 8 ♂ ♂, 9 ♀ ♀, Horseheads, New York, October-April (L. R. Rupert), [15 in coll. Rupert, 2 in coll. Franclemont]. 1 ♂, 2 ♀ ♀, Lambs Creek, PENNSYLVANIA (L. R. Rupert), [in Coll. Rupert]. 1 ♂, Ottawa, ONTARIO, Canada, Sept. 11, 1905 (C. H. Young);

2♂♂, 1♀, Lobe, Ontario, Canada, Oct. 2, 1924 (A. A. Wood), [in Coll. Canadian National Museum]. 1♂, 2♀♀, Bear Mt., New York (H. J. Erb); 1♂, 1♀, Lakehurst, NEW JERSEY (F. Lemmer); 2♀♀, Pennsylvania (Merrick), [in Coll. Buchholz].

LITHOPHANE SIGNOSA form **pallidicosta** form. nov. (Pl: I, fig. 6).

The costa, orbicular and reniform of the fore wing are grayish with some brown streaking; the remainder of the wing is blackish brown. This form agrees with normal *signosa* Walker in its streaked appearance; except in very intensely suffused specimens, the normal pattern is evident.

This form differs from *ferrealis* and *lignicosta* in its longer and narrower wings, and in its more streaked pattern. The wing shape will separate both the normal and suffused forms from the corresponding forms of *petulca* and *hemina*. The costa, orbicular and reniform are distinctly darker than *ferrealis*, and the suffused area is darker also, lacking the warm red tints of *ferrealis*.

Holotype: ♂, Ithaca, NEW YORK, Sept. 27, 1940 (J. G. Franclemont), [in Coll. Franclemont].

Allotype: ♀, Ithaca, New York, Oct. 2, 1940 (J. G. Franclemont), [in Coll. Franclemont].

Paratypes: 23♂♂, 18♀♀, Ithaca, New York, Sept.-April (J. G. Franclemont), [in Coll. Franclemont]. 14♂'s & ♀'s, Bristol, RHODE ISLAND, Sept.-May (Howard L. Clarke), [10 in Coll. Bost. Soc. Nat. Hist., 2 in Coll. U. S. N. M., 2 in Coll. Franclemont]. 1♀, Randolph, VERMONT, September, [in Coll. Bost. Soc. Nat. Hist.]. 1♀, Lafayette, INDIANA, Sept. 1, 1916 (H. J. Hart), [in Coll. U. S. N. M.]. 1♂, Nantucket Island, MASSACHUSETTS, Oct. (C. P. Kimball), [in Coll. Kimball]. 2♂♂, 3♀♀, NEW JERSEY [in Coll. Buchholz].

I wish to thank Dr. Richard Dow of the Boston Society of Natural History for the loan of the material referred to above from that Institution.

LITHOPHANE PATEFACTA form **niveocosta** form. nov. (Pl. I, fig. 8).

The costa, reniform and orbicular of the fore wing clay white; the remainder of the wing vinous brown; the ordinary markings of the normal form are present and discernible.

This form is very similar to *ferrealis*, but differs in the slightly less reddish hue of the suffused area and in the more yellowish hue of the costa, reniform and orbicular, that of *ferrealis* being somewhat ashy-gray in hue.

Holotype: ♂, Ithaca, NEW YORK, Sept. 6, 1940 (J. G. Franclemont), [in Coll. Franclemont].

Allotype: ♀, Lakehurst, NEW JERSEY, October 10 (Frederick Lemmer), [in Coll. Franclemont].

Paratypes: 26 ♂ ♂, 25 ♀ ♀, Lakehurst, New Jersey, Oct.-March (Frederick Lemmer), [20 in Coll. Lemmer, 19 in Coll. Franclemont, 7 in Coll. Buchholz, 3 in Coll. U. S. N. M., 2 in Coll. Cornell Univ.].

I wish to express my sincere thanks to the late Mr. Frederick Lemmer for his most generous loan of the material of this form.

LITHOPHANE DISPOSITA form **argillocosta** form. nov. (Pl. I, fig. 10).

Fore wing with the costa, reniform, orbicular and a subterminal shade luteous gray; the remainder of the wing suffused with blackish sepia. The ordinary markings visible, and as in normal *disposita*.

This form differs from all the rest in its very distinctly outlined reniform and orbicular, in this respect resembling *oriunda*. It has none of the brown or red shades of *ferrealis* and the foregoing new forms.

This is the form figured as "*hemma* Grt.—melanic" by Smith, Trans. Am. Ent. Soc., xxvii, pl. III, fig. 2. As a means of explanation, it might be well to say, that the *hemina* of the Smith collection were hibernated specimens of *disposita*, thus in the light of this information, Smith's statement is understandable.

Holotype: ♂, MANITOBA, Canada, Sept. 13, 1905 (ex. Coll. Buchholz), [in Coll. Franclemont].

Allotype: ♀ Cartwright, Manitoba, Canada (ex. Coll. Buchholz), [in Coll. Franclemont].

Paratype: 1 ♂, Miniota, Manitoba, Canada, Sept. 13, 1905; 1 ♀, Manitoba, Canada, Sept. 13, 1905; [in Coll. Buchholz]. 1 ♀ Aweme, Manitoba, Canada, Sept. 4, 1922 (N. Criddle); 1 ♀ Lobe, ONTARIO, Canada, Oct. 18, 1924 (A. A. Wood);

[in Coll. Canadian National Museum].

LITHOPHANE BETHUNEI form **luteocosta** form. nov. (Pl. I, fig. 12).

Forewing with the costa, reniform, orbicular and a subterminal shade white with a slight luteous cast; the remainder of the wing dusky black. The ordinary markings evident and as in the normal form of this species.

This form closely resembles *nivcocosta* and *ferrealis* in its light costa, but differs from these two forms in lacking all the warm reddish shades of these two forms.

Holotype: ♂ Lobe, ONTARIO, Canada, Sept. 23, 1924 (A. A. Wood), [in Coll. Canadian National Museum.]

This form was most generously loaned to me for description by Dr. J. H. McDunnough, and I wish to thank him for this kindness.

LITHOPHANE BETHUNEI form **duscalis** form. nov. (Pl. I, fig. 13).

The fore wing deep olive umber brown, slightly irrorate with gray; the ordinary markings as in bethunei proper; the reniform outlined by reddish russet; orbicular oblique, inconspicuous; the subterminal line an irregular series of pale spots with an irregular reddish russet shade on their inner side; the terminal area with a blackish shade below the costa and another at the anal angle, these bordered on their inner side by the subterminal line; the antemedial line indicated on its inner side by a double series of black dots on the veins, the postmedial by a similar series on its outer side; median shade irregular and diffuse, enveloping the reniform. The hind wing dusky black; the fringe pale russet contrasting with the rest of the wing.

This form resembles both *petulca* and *hemina*, but perhaps the former more than the latter; it is somewhat lighter than *hemina*, being of the general tone of *petulca*, but lacking the evident ashy-blue overcast of that species. One of the most outstanding features of this form is an oval spot of light grayish brown, just above the inner margin and between the postmedial and subterminal lines; this stands out very markedly and is not possessed by either *petulca* or *hemina*.

Holotype: ♂, Ithaca, NEW YORK, Sept. 27, 1940 (J. G. Franclemont), [in Coll. Franclemont].

Paratypes: 11 ♂ ♂, 10 ♀ ♀ (Bred ex ova), Ithaca, New York, 1941 (Franclemont), [in Coll. Franclemont].

(To be continued.)

The Male of Pagasa fasciventris H. M. Harris (Hemiptera, Nabidae).

By H. M. Harris, Ames, Iowa.

The February, 1940, issue of "The Entomological News" (Vol. 51, p. 35) carries the original description of this prettily marked species which has been known only from the female sex. Through the courtesy of Dr. R. H. Beamer, I now am privileged to characterize the male. Dr. Beamer writes that three hours of careful search in the same blue-stem patch where he collected specimens in 1939 yielded a single nymph. Fortunately, he was able to rear it to adulthood and thus make these notes possible. The species lives in the bases of clump-forming grasses such as blue-stem and, although ranging from Virginia to Nebraska and south-eastern Kansas, it apparently is very locally distributed and quite adept at hiding on the ground among the stem and roots of these plants. In the proportions given in the following description 48 units equal one millimeter.

Brachypterous male: Color as in female, head, anterior lobe of pronotum (except for spot on collar) and apical part of abdomen shiny black, the remainder of body and the legs reddish-orange. Body smaller than that of female and slightly more elongate. Head faintly longer than broad (40: 38). Vertex broader than eye (14: 11), the latter twice as long as wide (23: 11). Antennae colored as in female, but more intensely contrasted; proportion of segments, 14: 11: 43: 45: 40. Rostrum concolorous with legs, the base dark; proportions, 31: 32: 15. Pronotum narrow, longer than wide (65: 60), strongly shining. Scutellum dull. Hemelytra shiny, short, truncate apically, the costal margins almost parallel, the surface with punctures as in female. Legs slender, the front femur about two and two-thirds times as long as deep (55: 20), armed as in female. Venter not so hairy as in *P. fusca* (Stein), the claspers dark, much shorter and proportionately broader than in that species, but of same general type.

Length, 5.2mm. Width, (pronotum) 1.25 mm.; (abdomen) 1.65 mm.

Allotype, Brachypterous male, Cherokee County, Kansas, reared from nymph taken Aug. 24, 1941, R. H. Beamer; in collection of University of Kansas.

Weevils (Coleoptera, Curculionidae) Affecting Chufa (Cyperus esculentus).

By A. F. SATTERTHWAIT, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture

(Continued from page 16.)

CALENDRA CALLOSA (Oliv.).

The adult curlew bug (*Calendra callosa* (Oliv.)) has a broad depression in the basal third of each wing cover, a prominence at the outer basal angle, another near the apex of each wing cover, and fine punctures on the basal portion of the lateral pronotal carina. The new adult stays in its cell a few days, and at this time it has a burnished-gold sheen over its olive-brown body. After it has traveled in the moist soil it loses its beauty and in its usual haunts becomes very difficult to distinguish from the soil. Like many other species of insects whose larvae are internal tissue feeders, the curlew bug varies much in size. The usual length in the adult stage is from 9.5 to 12 mm., although the range is from about 7 to 12 mm.

The *egg* is pearly white, 1.84 to 2.11 mm. long and 0.73 to 0.95 mm. wide, and rounded at the ends.

The mature *larva* measures approximately 13 mm. in length. Its head is yellow or red and from 0.71 to 2.60 mm. in width from hatching to maturity; its body is white, about half as thick at the middle as long. It makes its pupal cell in the plant by packing shredded plant tissue in the ends of the excavation or in the soil. It will smooth the surface of the excavation and press it, perhaps modify it with body juice; at any rate, the cell is fairly strong and resistant to possible predatory insects. The pupal stage covers about 5 days.

The *pupa* is about 8.17 to 12.83 mm. long, with 6 rostral tubercles, the basal pair elevated, granular or trilobed, darker than the rest of the head, and usually is without setae.

The *adult* usually feeds head downward, inserting the beak in the root crown or in the stem within 50 mm. of the soil level. The curlew bug oviposits to some extent in 15 known species

of plants, appearing definitely to prefer chufa to any other. The egg is laid in the leaf sheath or top of the crown; the larva hatches and excavates the inner leaves, or, in the event the flower stalk has developed, the interior of the flower stalk. As the larva grows and progresses in its feeding, the central leaves die, or, if the flower stalk is present and infested, the flower stalk dies. A cursory examination of a stand of chufa within a few days after the eggs have hatched reveals conspicuously the feeding places of the larva. As the chufa season progresses, the greatest number of destroyed plants is chargeable to the work of this billbug. The larva normally requires from 3 to 5 weeks to complete its growth, and if it cuts its way out of one plant before having completed feeding it will enter the base of another. It may pupate in the larval excavation in the plant or leave the plant and make a pupal cell in the soil within about 2 inches of the plant.

The seasonal history of this insect appears to vary according to locality. In Alabama, in the vicinity of Mobile, it has been found in egg, larval, and pupal stages on September 16. From an egg collected September 16, a larva issued September 23 and pupated October 26. From this pupa an adult issued December 18, at Webster Groves, Missouri. Its development would no doubt have been substantially accelerated in the higher temperature of Mobile.

In Mississippi, at Jackson, eggs were collected June 14, 1922, and larvae were found from June 15 to September 19, one of those collected on the last date being newly hatched. At Holly Springs, a pupa was taken June 17, 1922; other immature forms collected June 18 and subsequently fed at Webster Groves, yielded adults in the period June 23 to November 20.

In Arkansas, at Fayetteville, eggs and larvae were collected June 11, 1923; at Blytheville, eggs and larvae on June 25, 1922; at Osceola, larvae on June 26, 1922; at Benton, eggs and larvae on June 18, 1922. Pupation at Webster Groves took place in material of the Blytheville collection as early as July 10, yielding the adult July 12, and as late as August 19

from the Osceola collection, yielding the adult August 28.

It is probable that in the vicinity of the Gulf coast, and possibly also throughout Arkansas, the species may overwinter in two or more stages, but there is no evidence that any stage excepting the adult winters successfully in the area as far north as St. Louis.

These studies of the curlew bug have failed to show any tendency on its part to oviposit in corn in Ohio, Indiana, Kentucky, Tennessee, Michigan, Wisconsin, Iowa, Illinois, Missouri, Kansas, Arkansas, or Oklahoma. On the other hand, Z. P. Metcalf found, first, that the species in eastern North Carolina did oviposit in corn,* and, second, that probably no other corn insect caused so great a loss, both directly and indirectly, in the eastern part of this State as did the curlew bug. Where the curlew bug is thus able to develop in corn, the elimination of chufa from corn ground becomes less important in the control of this weevil.

In the vicinity of St. Louis, Missouri, this species and the destructve billbug (*Calendra destructor*) feed chiefly on chufa. The curlew bug has an earlier feeding period or a shorter season, for in this locality it is the dominant species in chufa late in August whereas the destructive billbug is the dominant species in this host plant in September.

The foregoing generalized statement is based on records of over 1,500 living specimens of the curlew bug.

CALENDRA DESTRUCTOR (Chitt.).

The destructive billbug (*Calendra destructor* (Chitt.)) ranges in length from 7 to 12 mm. and may be distinguished from the curlew bug, which frequently it closely resembles, by having the bases of at least two of the first three even intervals depressed at the bases of the elytra and by the presence of coarse punctures on the bases of the lateral pronotal carinae. The corresponding punctures of the curlew bug are fine. The newly developed adult exhibits a velvety texture but entirely without the burnished-gold sheen of the curlew bug. The

* E. G. Kelly (note files) records eggs on corn at Wellington, Kansas.

color is dark brown or black.

The egg closely resembles that of the curlew bug and ranges in length from 1.66 to 1.83 mm. and in width from 0.73 to 0.84 mm.

The larva likewise closely resembles that of the curlew bug. The width of the head ranges from 0.49 mm. in the first instar to 2.14 mm. at maturity.

The pupa ranges in length from 8.05 to 10.84mm. The rostrum bears six similar seta-bearing tubercles, and the mesonotum, the metanotum, and the tergite of the eighth abdominal segment each bear one or more pairs of setae. As usual in this genus of snout beetles, the adult of the destructive billbug usually eats with its head directed downward, inserting the beak through an inconspicuous puncture and feeding at large in the interior of the leaf sheath of the bud or flower stalk, often enlarging the feeding cavity by tearing the plant tissue longitudinally without withdrawing its beak.

Oviposition occurs in some of the feeding punctures. When the beak is withdrawn, the punctured slit of the plant closes fairly well. The oviposition period appears to begin as early as with any of the other billbug species in the Mississippi Valley and continues definitely later in the season, with fair volume, than that of other species working in chufa. This period, in the St. Louis section, extends from May 12 to September 22.

The incubation period of the eggs is not appreciably different from that of other species and averages about 5 days. The larva begins excavating in the egg cell and may work part way up or down the stem . When it emerges from its excavation it usually enters the base of another plant. Pupation occurs either in the larval excavation or in the soil close by. The pupal cell is limited, in the larval excavation, by packed, torn plant tissues; when located in the soil, a fairly good cocoon is made of torn plant tissue. The pupal period lasts from about 8 to 18 days. The life cycle of the destructive billbug and its size in larval and adult stages are rather similar to those of the curlew bug.

The following collections were made: At Chandler, Oklahoma, numerous eggs and larvae in chufa on June 11, 1923; at Manhattan, Kansas, numerous eggs on June 16, 1924; at Thayer, Missouri, one egg on May 24, 1918, and one larva June 13, 1921; in St. Louis County, Missouri, eggs on July 11, 1924, newly hatched larvae on September 22, 1923, and larvae, pupae, and new adults on September 27 of the same year; at Dupo, Illinois, one larva on August 15, 1922; and at Athens, Indiana, eggs and larvae on June 21, 1916.

CALENDRA CARIOSA (Oliv.).

One larva of *Calendra cariosa* (Oliv.) was found in one of three plants of *Cyperus esculentus* collected at Delchamps, Alabama, July 1, 1923; it pupated August 6.

A mature larva of *Calendra cariosa* was collected December 12, 1931, in a pupal cell in the soil under a chufa plant at Wiggins, Mississippi. A female adult issued January 2.

This species is distinguished from any other billbug by the peculiar elytral sculpture, in which rather large, shallow, depressed areas include two or more broad, shallow strial punctures or interval punctures. The pronotum has a central, diamond-shaped, polished area and is broadly canaliculate on both sides of the central elevation. The species attains a length of 13.5 mm.

The preferred host plant of this billbug appears to be the horned rush (*Rynchospora corniculata*), though it is rather a general feeder on sedges.

..The *pupa* of this species has the rostrum with only six seta-bearing tubercles, all conical, the basal pair set on broad, moderately high, and wrinkled prominences, the prominences not darker than the head, the base wrinkled, not appearing lobed or granular. Its length is 9.31 to 17.00 mm., the average being 12.49 mm.; the pronotal width is 2.66 to 4.40 mm., averaging 3.55 mm.

CALENDRA PARVULA (Gyll.)

Three eggs of a corn billbug were found in *Cyperus esculentus* at Arkansas City, Kansas, on June 5, 1924. One egg,

measuring 1.50 mm. long by 0.52 mm. thick, hatched June 10, yielding a pupa on August 4 and an adult female of *Calendra parvula* (Gyll.) on August 7.

This is the blue-grass billbug, definitely bred from 18 species of plants, but rarely from chufa. This little weevil has a fairly uniformly punctured pronotum, fairly smooth intervals on the elytra, and a long beak; its length is about 7 mm.

The *pupa* has only four rostral tubercles, all seta-bearing. The eighth abdominal tergite has one pair of large dorsal setae as large as the largest on the ninth tergite. The species is slender, from 5.58 to 10.22 mm. in length, and the pronotal width from 1.93 to 3.98 mm., the beak appears to be long and slender, and the ninth tergite has six to eight large setae.

CALENDRA VENATUS (Say.).

The hunting billbug (*Calendra venatus* (Say)) ranges from 6 to 11 mm. in length. It is smaller than the curlew bug and is best distinguished from the other species mentioned by a depression on the disk of the pronotum immediately back of the head. The color of this billbug is black.

The egg closely resembles that of the curlew bug and ranges from 1.34 to 1.87 mm. in length and from 0.46 to 0.83 in diameter.

The larva passes through the same number of instars and requires approximately the same length of time to mature as the curlew bug. The width of the head ranges from 0.29 mm. in the first instar to 1.97 in the last.

The pupa is about 9.22 to 12.75 mm. long, with six rostral seta-bearing tubercles.

The hunting billbug appears to breed more freely in chufa than in any other of its known host plants.

In Indiana, near Chalmers, numerous eggs have been taken in chufa on June 20, 1916, and in Missouri at Webster Groves on August 5, 1925. Larvae were taken near Charleston, Missouri, July 20, 1918.

Numerous adults have been taken associated with chufa or attacking corn on ground heavily infested with chufa, circumstances which strongly indicated that these adults had developed in chufa.

RECOMMENDATIONS FOR CONTROLLING CHUFA INSECTS.

Although the chufa crop is grown almost entirely as food for hogs and represents a limited acreage, producers are confronted with the problem of control of its insect enemies. The present studies indicate that the tubers, which are the all-important part. of the crop, are not subject to direct insect attack. This is very fortunate, for there would seem to be no effective control for tuber-destroying insects except such as might be effected by the prevailing practice of allowing hogs to harvest the crop.

Since the chufa is grown as an annual crop, it appears that all the insects noted in this paper can be controlled through the destruction of crop residues, by clean cultivation, and by disturbing the soil deeply enough to destroy the crowns. Where practicable, all the tops of the plants should be destroyed before midwinter. It is suggested that the grower smooth the ground and burn whatever chufa material the hogs have left on the surface, even though this may include some tubers.

The most injurious chufa pests so far recognized are weevils. The habits of the weevils afford almost no opportunity for control outside of cultural practices. In the case of the billbugs as pests of corn or small grains, our best recommendation is the elimination of the preferred host plant in proximity to the corn or other grain fields. As chufa is the preferred host plant of several of these insects, control recommendations are restricted to clean cultural practices not incompatible with the hog-harvesting method of handling the crop.

Notes Concerning Eschatomoxys wagneri Blaisdell (Coleoptera: Tenebrionidae).

By FRANK E. BLAISDELL, Sr., Stanford Medical School and Associate in Research, California Academy of Sciences, San Francisco, California.

In 1935, a new Triorophid was collected in Death Valley, Inyo County, by Roy L. Wagner, of Fresno, California. The unique specimen was submitted to the Author for determination. It was recognized as an unusual species, and was described in the Pan-Pacific Entomologist of July, 1935, as *Eschatomoxys wagneri* Blais.

It was learned later that Mr. P. H. Timberlake, of River-

side, California, had also collected a specimen. Dr. E. C. Van Dyke during a recent visit with him, obtained the following data: "The species was found in the Painted Canyon near Mecca, Imperial County, California, April 18, 1925. Mr. Timberlake is confident that it was taken from beneath a stone."

In April of the present year, three additional specimens were received from Glen M. Kohls, Assistant Entomologist of the Rocky Mountain Laboratory, Hamilton, Montana. Mr. Kohls has very kindly supplied the following data concerning their discovery and habitat, also with permission to retain them in the collection of the Entomological Laboratory of the California Academy of Sciences. The specimens "were taken in a mine located about fifteen miles north-east of Yuma, Arizona, in California on the road out of Bard."

"The mine is operated during the Winter by a Mr. Clapp. The entrance goes down at an angle of about 20 degress, to a depth of over 200 feet." Mr. Kohls also stated: "At the 160 foot level, we turned off into a drift and followed it about 100 yards or so, to the end where we stopped to search mainly for bat ticks (Argasidae) in the cracks and fissures of the rocks. In prying off the loose pieces of rock from the walls and top of the tunnel, several of the beetles were found. Only three were preserved, but several more could have been collected, since they were not at all scarce. The psychrometric readings were: Wet bulb 72, dry bulb, giving a relative humidity of about 78, without corrections for elevation, etc. Bats were present and there were a few small deposits of guano; no other organic material was noted."

"We were working near the end of drift where there was no timbering. An enclosed photograph gives some idea of the semi-desert country surrounding the mine."

The type of *Eschatomoxys wagneri*, a male, measures in length 9 mm. and 4 mm. in width. Those secured by Mr. Kohl, are one male and two females, the larger of the latter measures 11 mm. in length and 5 mm. in width. Only four specimens are known; the species is more or less subterranean.

Misidentified Genotypes.

By N. D. Riley, Dept. of Entomology, British Museum (Natural History), London.

The preparation of the reports on the Generic Names of British Insects, now being published by the Royal Entomological Society of London, is providing an interesting test, on a fairly large scale, of the efficiency of the International Rules of Zoological Nomenclature in their present form. When it is considered that practically all the really knotty problems in entomological nomenclature are the unwitting creation of the early European authors, and concern the European genera, it is satisfactory to find how relatively few are the cases in which it has been necessary, in order to avoid "greater confusion than uniformity", to apply for suspension of the Rules.

As an official of the British Museum (N. H.), in which a good deal of the work on these lists has been and is being done, and in other capacities, I have been privileged to see in MS. most of the reports already published, and to have before me others in various stages of completion. And it is instructive to find that practically the only constantly recurring difficulty now remaining is that which centres around the fixation of genotypes when the species concerned have been misidentified either by the original author of the genus or by an author who subsequently designated the type species.

This particular difficulty was dealt with at some length in Opinion 65, but so inconclusively as to have left the whole matter in doubt ever since. For this, the unfortunate phrase "it is to be assumed that his determination of the species is correct" is largely to blame since some authors have taken this to be mandatory, overlooking the necessary implication of the phrase to the effect that if the assumption is *proved* incorrect the whole argument falls to the ground. That this is the correct interpretation of the phrase is clear if the full and unanimous Opinions published up to that time (not just the summaries) be consulted. Here, notably in Opinions 19 and 46, phrases such as "an identification is to be accepted as correct until

shown to be incorrect", "an author's recognition" of a species is "assumed to be correct until proved incorrect" occur not once but many times over. There seem, in fact, no grounds for maligning the Commission by the suggestion that, by this phrase in Opinion 65, they had any intention of forcing zoologists to accept as correct identifications which are demonstrably false.

Yet to the writer, and to his colleagues, this argument seems in reality quite beside the point. If difficulty and doubt have arisen they have been created by the Commission itself, and notably by Opinion 65, for the Rules themselves are quite unequivocal. The whole matter is covered by Article 30, which deals with the designation of the type *species* of genera. It is implicit in this article that the types of genera are *species,* and if this fundamental fact be borne constantly in mind, there should be no difficulty whatever in arriving at the correct solution. This may entail more labour than is involved in the arbitrary practice of accepting *albus* as the generic type of *X-us,* without reference to the identity of either, a practice which, though it may be sound in nomenclature, may equally well be very unsound taxonomy. But inasmuch as we are to assume that an identification is correct, unless proved incorrect, it is seldom that any considerable research will be needed since the cases involving an obviously doubtful identification are relatively few, and will diminish.

The writer will be very grateful for expressions of opinion from taxonomists interested in this question, for he feels that his interpretation of Article 30 of the Rules is the correct one and that it automatically removes a serious obstacle to nomenclatural progress. He also believes that the opposite course, referred to above as an arbitrary practice, yet adopted by some writers, will be found on ultimate analysis to rest on no more substantial grounds than a misunderstanding of the Article or their own convenience, and that should this practice be allowed to grow it cannot fail, because of its inherent falsity, to bring the work of the International Commission on Zoological Nomenclature into disrepute.

Taxonomic Notes on the Genera Chelostoma and Ashmeadiella (Hymenoptera, Megachilidae).

By CHARLES D. MICHENER, University of California, Berkeley, California.

Since but four species of the genus *Chelostoma* are known from the Western Hemisphere, all occurring along the Pacific Coast of the United States, the discovery of a fifth species in northern California is of considerable interest. In addition several facts affecting the nomenclature and known distribution of various species of *Ashmeadiella* have come to light since the publication of a revision of the genus (Michener, 1939, Amer. Midl. Nat., 22: 1-84). These are recorded in the following pages.

Chelostoma tetramerum n. sp.

This is a moderate sized, slender, black species.

♂: Length 6.5 mm. Pubescence sparse, whitish, not forming transverse bands on abdominal terga. Punctation of body fine and rather even, that of mesoscutum as coarse as that of vertex; horizontal area of propodeum finely rugose, shorter than metanotum. Proboscis not greatly elongate, glossa as long as face; first segment of labial palpi about one-third as long as second; maxillary palpi four-segmented, first segment short and globular, second longest, third but little shorter than second, and fourth markedly shorter than third. Wings dusky, veins and stigma black; second abscissa of cubital vein shorter than fourth. Posterior margins of abdominal terga one to six narrowly brownish; seventh tergum ending in three processes, the median, which is triangular and about as long as basal width, directed more ventrally than the incurved laterals which are about one and one-half times as long as their basal widths; seventh tergum with large, median, dorsal, longitudinally elongate depression; second sternum with transverse elevated area; parameres pointed but not attentuate apically; coxopodites of genitalia slender and straight, slightly enlarged apically, with a few rather long hairs near apices.

Holotype male (Ent. No. 5216, Calif. Acad. Sci.): Shingletown, Shasta County, CALIFORNIA, May 23, 1941, flying over nearly bare ground (C. D. Michener). *Paratype* (author's collection), same data but on a small, yellow-flowered species of *Mimulus*.

This species resembles *C. phaceliae* Michener in the four-segmented maxillary palpi but differs from that form in the much shorter proboscis, proportions of the segments of the labial palpi, absence of the abdominal hair bands, shorter processes of the seventh tergum with the median one directed more downward than the lateral ones, more enlarged apices of the coxopodites of the male genitalia, and simple rather than attenuated apices of the parameres similar to those illustrated (Pan-Pac. Ent., 14: 36-45, 1938) for *minutum*. This species is also larger than most specimens of *phaceliae*, although certain individuals of that species from Mt. Diablo, California, are 6.5 mm. long. In its large size *tetramerum* approaches *C. californicum* Cresson, differing by the longer processes of the seventh abdominal tergum, the absence of pubescent fasciae on the terga, the relatively straight rather than downcurved parameres and coxopodites of the male genitalia, and the four-segmented maxillary palpi. From *C. bernardinum* Michener, the other American species with three processes on the seventh abdominal tergum of the male, *C. tetramerum* may be distinguished by the shorter processes of the seventh tergum, the more coarsely punctate mesoscutum, and the four-segmented maxillary palpi.

ASHMEADIELLA.

The late Grace A. Sandhouse wrote to me stating that the three original type specimens of *Ashmeadiella cactorum* (Cockerell) are in the National Museum, bearing Cockerell's label, "*H. cactorum* n. sp.", and that they belong to the form previously regarded as *A. curriei* Titus. My identification of *cactorum* was based upon specimens determined by Cockerell subsequent to the time the species was described. Unfortunately it is from the three cotypes that a lectotype of *cactorum* must be selected; that bearing Cockerell's number 3449 is here designated as lectotype. The name *cactorum* therefore replaces *curriei*, and for the species which I have previously regarded as *cactorum* the name *meliloti* Cockerell is available. The following synonymies indicate the nomenclatorial changes resulting from the correction of the use of the name *cactorum*.

For the sake of brevity only the key citations are here indicated; others may be found in the revisional paper already referred to.

ASHMEADIELLA (ASHMEADIELLA) MELILOTI MELILOTI (Cockerell). *Heriades meliloti* Cockerell, 1897, Ann. Mag. Nat. Hist., (6) 20: 141, ♂ ♀. *Ashmeadiella meliloti,* Cockerell, 1898, Bull. Denison Univ., 11: 64, ♂. *Ashmeadiella cactorum cactorum,* Michener (misidentification), 1936, Amer. Mus. Nov., 875: 8, ♀ ♂. *Ashmeadiella (Ashmeadiella) cactorum cactorum,* Michener, 1939, Amer. Midl. Nat., 22:42, ♀ ♂.

A. (A.) MELILOTI ASTRAGALI Michener. *Ashmeadiella (Ashmeadiella) cactorum astragali* Michener, 1939, Amer. Midl. Nat., 22: 44, ♀ ♂.

A. (A.) MELILOTI CRASSA Cockerell. *Ashmeadiella crassa* Cockerell, 1924, Proc. Calif. Acad. Sci., (4) 12: 558, ♀ (part). *Ashmeadiella (Ashmeadiella) cactorum crassa,* Michener, 1939, Amer. Midl. Nat., 22: 44, ♀.

A. (A.) MELILOTI ARIDULA Cockerell. *Ashmeadiella aridula* Cockerell, 1910, Entom., 43: 91, ♂. *Ashmeadiella cactorum aridula,* Michener, 1936, Amer. Mus. Nov., 875: 9, ♂ ♀. *Ashmeadiella (Ashmeadiella) cactorum aridula,* Michener, 1939, Amer. Midl. Nat., 22: 44, ♀ ♂.

A. (A.) CACTORUM CACTORUM Cockerell. *Heriades cactorum* Cockerell, 1897, Ann. Mag. Nat. Hist., (6) 20: 140, ♀. *Ashmeadiella cactorum,* Cockerell, 1898, Bull. Denison Univ., 11: 64, ♀. *Ashmeadiella curriei* Titus, 1904, Proc. Ent. Soc. Wash., 6: 100, ♀ (new synonym). *Ashmeadiella (Ashmeadiella) curriei curriei,* Michener, 1939, Amer. Midl. Nat., 22: 15, ♀ ♂. *Ashmeadiella basalis nigra* Michener, 1936, Amer. Mus. Nov., 875: 7, ♀ ♂. *Heriades prosopidis* Cockerell, 1897, Ann. Mag. Nat. Hist., (6) 20: 140, ♂, nec ♀.

A. (A.) CACTORUM ECHINOCEREI Cockerell. *Ashmeadiella echinocerei* Cockerell, 1911, Can. Ent., 43: 132, ♀. *Ashmeadiella (Ashmeadiella) curriei echinocerei,* Michener, 1939, Amer. Midl. Nat., 22:16, ♀.

A. (A.) CACTORUM BASALIS (Michener). *Ashmeadiella basalis basalis* Michener, 1936, Amer. Mus. Nov., 875: 6, ♂ ♀. *Ashmeadiella (Ashmeadiella) curriei basalis,* Michener, 1939, Amer. Midl. Nat., 22:17, ♀ ♂.

Additional localities for this subspecies are: Santa Rosa Mountain, Riverside County, California, 6000 to 7500 feet elevation, May 31, June 8 and 16, 1940, on *Lotus davidsonii* (C. D. Michener) and Westgard Pass, Inyo County, Cali-

fornia, May 26, 1937 (N. W. Frazier). The latter specimens are of interest since they, like the specimens from the Clark Mountains recorded in 1939, are from a desert mountain range in which this ordinarily cismontane subspecies would not be expected.

A. (A.) OCCIPITALIS Michener. This species was collected ten miles south of Tucson, Arizona, August 7, 1940, on *Verbesina exauriculata,* also taken at several localities in Cochise County, Arizona, on the same flower (C. D. Michener).

ASHMEADIELLA (AROGOCHILA) FOXIELLA Michener. *Ashmeadiella* (*Arogochila*) *foxiella* Michener, 1939, Amer. Midl. Nat., 22: 73, ♂. *Ashmeadiella* (*Chilosima*) *washingtonensis* Michener, 1939, Amer. Midl. Nat., 22: 80, ♀. (new synonym).

The female described as *A. washingtonensis* was placed in the subgenus *Chilosima* with considerable doubt, but its relationship with a male *Arogochila* was not suspected. The two sexes, however, were collected together by the author at Hat Creek, Shasta County, California, on June 4, 1941, visiting the slender whitish flowers of a species of *Pentstemon.* Although the female is a peculiar form not closely related to any other species and possibly worthy of separation as a distinct subgenus, the similarity of the male to that of *Arogochila* leads to the belief that this species, like *A. barberi* Michener, the female of which also has quadridentate mandibles, is a derivative of *Arogochila.*

In the key to the females of *Arogochila* this species runs to 2 and is separated from *A. sculleni* Michener and *A. barberi* Michener by the absence of the lateral lobes of the clypeus. One of the males from Hat Creek, unlike other specimens studied, has the median teeth of the sixth abdominal tergum twice as long as broad.

A. (A.) TIMBERLAKEI TIMBERLAKEI Michener. This form was collected on Santa Rosa Mountain, Riverside County, California, 6000 to 7500 feet elevation, on *Lotus davidsonii,* May 31, June 15 and 18, 1940 (C. D. Michener); five miles east of Burney, Shasta County, California, on *Phacelia,* June

8, 1941 (C. D. Michener). In one female from the latter locality the median lobe of the clypeus is unusually broad and rounded and but feebly notched at the apex.

A. (A.) SALVIAE Michener. Although previously known only from southern California, a specimen of *A. salviae* was taken at Mount Diablo, Contra Costa County, California, June, 1939.

ASHMEADIELLA (CHILOSIMA) RHODOGNATHA Cockerell. Among numerous typical individuals of this species from El Mayor, Lower California, Mexico, April 3, 1940, on *Prosopis chilensis* (C. D. Michener) is a single female in which the legs are red and the posterior margins of the abdominal terga broadly red. This may indicate that *A. rhodognatha* is a black subspecies of the New Mexican *A. holtii* Cockerell.

ASHMEADIELLA (CUBITOGNATHA) XENOMASTAX Michener. Mr. P. H. Timberlake has very kindly allowed me to study a male and female of this species which he collected three miles southwest of Victorville, California, on *Dalea saundersii*, May 12, 1939. The male of this subgenus, which has not previously been described, runs to *Ashmeadiella* s. str. and *Titusella* in my key to subgenera, and differs from most of the species included in those groups by the somewhat emarginate apex of the labrum. The male is described as follows:

Length 6 mm. Anterior margins of eyes divergent below; face densely covered with white pubescence largely obscuring surface; clypeus finely and densely punctate, its apical margin with broad, shallow emargination; frons and vertex a little more coarsely punctate than clypeus but densely so; anterior ocellus but little posterior to midpoint between antennal bases and posterior margin of vertex; posterior ocelli separated by a distance equal to that to nearest eye margin and hardly less than distance to posterior edge of vertex; flagellum reddish brown beneath; mandibles bidentate, red except bases and apices; labrum elongate, apex with broad, shallow emargination. Punctures of scutum and scutellum and mesepisternum coarser and less dense than those of vertex; all tarsi reddish; posterior legs red beyond trochanters except for black posterior surfaces of tibiae. Abdomen red except for black basal middorsal spots on terga, spot of fourth tergum largest, spots of preceding and following terga diminishing in size; sixth tergum with lateral margins slightly sinuate, lateral teeth not broad, but short and rounded apically, median teeth much broader than long, irregularly rounded and separated by an emargination much broader than a semicircle.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. All continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of **Entomological News** for 10c. The number of, or annual **volume,** and in some cases the part, heft, &c., the latter **within ( )** follows; then the pagination follows the colon :

Papers published in the Entomological News are not listed.

GENERAL. — Altsheler, B. — Natural History Index Guide. Section 10. Zoology. 1940. 249-265. **Anon.**—Prof. S. Kopeć. [31] 148: 655. **Brodsky, Nevsky, Beliaeva & Tcholpankulov.**—Zoocenoses of the high mountain Pamir. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 23: 21 pp. **Brown, F. M.**—A gazetteer of entomological stations in Ecuador. [7] 34: 809-851, ill. **Callan, E. McC.** — Resistance of plants to insect attack. [Jour. Imp. Coll. Trop. Agric.] 18: 229-231. **Hamly, D. H.**—Color systems. [68] 94: 586. **Hatch, M. H**—The logical basis of the species concept. [Biol. Symposia] 4: 223-293. **Hyslop, J. A.** — Insects and the weather. [Climate & Man.] 1941: 503-507. **McIntosh, A.** — The designation of type specimens in describing new species. [Suppl. Jour. Parasit.] 27: 11. **Merrill, M. C.** — The publications of the United States Department of Agriculture and the policies covering their dstribution. 1941. 23 pp. **Scott & Opydyke.**—The emergence of insects from Winona Lake. [Ind. Dept. Conserv. Div. Fish & Game] 2: 5-15, ill.

ANATOMY, PHYSIOLOGY, ETC. — Barton-Wright, E.—Flour and the growth of Tribolium. [31] 148: 565-566. **Bodine, J. H. and T. H. Allen.** — Enzymes in ontogenesis (Orthop.). XX. The site of origin and distribution of protyrosinase in the developing egg of the grasshopper. [42] 88: 343-352. Enzymes in ontogenesis. [92] 81: 388-

391, ill. **Carlson, L. D.**—Enzymes in ontogenesis (Orth.) [92] 81: 375-387, ill. **Gatenby, J. B.** — The neck body in normal and x-radiated insect spermatogenesis. [Pro. Ry. Irish Acad.] 47: 149-159, ill. **Gayden, J. H.**—Studies in the embryology of Cylas formicarius. [La. Acad. Sci.] 5: 32. **Gobeil, A. R.**—La diapause chez les Tenthredes. [Canadian Jour. Res.] 19: 383-416. **Kalmus, H.** — The resistance to desiccation of Drosophila mutants affecting body colour. [Proc. Royal Soc.] 130 (B): 185-201. **Prebble, M. L.** — The diapause and related phenomena in Gilpinia polytoma. [Canadian Jour. Res.] 19: 417-436; 437-454. **Ray, C. N.** — Extra strong heliotropic effect of neon lights. [68] 94: 585-586. **Yakhontov, V.**—Thysanoptera found in the process of soil investigation of middle Asia. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 49: 7 pp. **Yeager & Munson.**— Histochemical detection of glycogen in blood cells of the southern armyworm (Prodenia eridania) and in other tissues, especially midgut epithelium. [47] 63: 257-294, ill. (See also various authors under Arachnida, Hemiptera, Diptera and Coleoptera below).

ARACHNIDA AND MYRIOPODA. — Archer, A. F. — Supplement to the Argiopidae of Alabama. [Ala. Mus. Nat. Hist.] Mus. Pap. 18: 47 pp., ill. **Chamberlin, R. V.**—On a collection of Millipedes and Centipedes from northeastern Peru. [Bull. Amer. Mus. Nat. Hist.] 78: 473-535, ill. New genera and species of North American geophiloid centipeds. [7] 34: 773-790. **Doetschman, W. H.**—The occurrence of mites in Pinnipeds, including a new species from the California sea-lion, Zalophus californianus. [Suppl. Jour. Parasit.] 27: 23. **Jiles, E. C.**—The skeletal musculature of the centipede. [La. Acad. Sci.] 5: 33. **Lavers, C. H., Jr.**—A new species of Limnochares from North America. [Univ. Wash. Publ. Biol.] 12: 6 pp., ill. **Semans, F. M.** — Black widow spider. Distribution in Ohio. [Ohio J. Sci.] 41: 380. **Sternhold & Getzonok.** Influence of some factors upon the life-cycle of Boophilus annulatus calcaratus. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 47: 12 pp. **Warren, E.**—On the genital system and modes of reproduction of certain gamasid mites. [Ann. Natal Mus.] 10: 95-126, ill. On the occurrence of nematodes in the haemocoel of certain gamasid mites. [Ann. Natal Mus.] 10: 79-94, ill.

THE SMALLER ORDERS OF INSECTS. — Bickley, W. E. — Records of Tennessee Chrysopidae. [10] 43: 187-189. **Cowley, J.**—A new species of Protoneura from Peru

and a review of the group of Protoneura tenuis. [36] 91: 145-173, ill. **Crawford, J. C.** — A new Taeniothrips from Panama [10] 43: 184-186, ill. **Geijskes, D. C.** — Notes on Odonata of Surinam. [7] 34: 719-734, ill. **Holdsworth, R. P., Jr.** — Additional information and a correction concerning the growth of Pteronarcys proteus. [7] 34: 714-715, ill. **Svihla, R. D.**—A list of the fleas of Washington [Univ. Wash. Publ. Biol.] 12: 11-19. **Walker, E. M.**—The nymph of Somatochlora walshii [4] 73: 203-205, ill. **Ward, J. W.**—The occurrence of Heterodoxus longitarsus (Mallophaga) on dogs in Mississippi. [Suppl. Jour. Parasit.] 27: 30. **Wheeler, Douglas & Evans.**—The role of the burrowing owl and the sticktight flea in the spread of plague. [68] 94: 560-561. **Whitehouse, F. C.** — British Columbia dragonflies with notes on distribution and habits. [119] 26: 488-557, ill. **Kennedy, C. H.**—Perissolestes paprzyckii, a new Perilestine dragonfly from Peru. (Lestid.) [7] 34: 852-854, ill. (See also Howell, T., under Diptera, and Austin & Richardson under Coleoptera).

ORTHOPTERA. — Gurney, A. B. — Taxonomic and bionomic notes on the grasshopper Melanoplus impudicus (Acridid.) [119] 26: 558-569, ill. **Moreau, R. E. & W. M.**— Birds eating a "Distasteful" grasshopper. [The Ibis] 5: 615. **Roberts, H. R.**—A comparative study of the subfamilies of the Acrididae primarily on the basis of their phallic structures. [Proc. Acad. Nat. Sci. Phila.] 93: 201-246, ill. **Semans, F. M.** — Protozoan parasites of the Orthoptera, with special reference to those of Ohio. [43] 41: 457-464. **White & Rock.** — New records of Acrididae from Alberta [4] 73: 216.

HEMIPTERA.—Caldwell, J. S.—A preliminary survey of Mexican Psyllidae. [43] 41: 418-424. (k). **de Carlo, J. A.**—Descripcion de dos especies nuevas del genero Limnocoris. Nuevas consideraciones sobre Cryphocricus daguerrei y Cryphocricus rufus de Carlo. (Naucorid.). [Rev. Soc. Ent. Argentina] 11: 37-41, ill. **deLong, D. M.**— Some new species of Mexican Osbornellus (Cicadellid.). [An. Exc. Nac. Cien. Biol., Mexico] 2: 263-270, ill. **Drake & Hambleton.** Two new Peruvian Tingitidae. [Iowa State Coll. Jour. Sci.] 16: 329-330. **Ferris, G. F.** — The genus Aspidiotus (Diaspidid.). [117] 6: 33-69, ill. **Knowlton & Stains.** — Geocoris atricolor feeding. [19] 36: 201-202. **Mathis & Nicolle.** — Sur le comportement des Réduvidés hématophages Rhodnius prolixus et Triatoma infestans, et

leur aptidude a transmettre la maladie de Chagas. [77] 135: 28-30. **Nicolle & Mathis.**—Le thermotropisme, facteur déterminant primordial pour la piqure des Réduvidés hématophages. [77] 135: 25-27. **Rosewall, O. W.** — The male genital segment of Pentatomidae. [La. Acad. Sci.] 5: 33-34. **Russell, L. M.**—A classification of the scale insect genus Asterolecanium. [U. S. Dept. Agric.] Misc. Publ. No. 424: 322 pp., ill. **Sampson & Drews.**—A review of the Aleyrodidae of Mexico. [An. Esc. Nac. Cien. Biol., Mexico] 2: 143-189, ill. (*k). **Smith, C. F.**—The genus Drepanaphis Del Guercio east of the Rocky Mountains. [Jour. E. Mitchell Sci. Soc.] 57: 226-242, ill. **Usinger, R. L.**—Rediscovery of Emesaya brevicoxa and its occurrence in the webs of spiders (Reduviid.). [19] 36: 206-208.

LEPIDOPTERA. — Beall, G. — The monarch butterfly, Danaus archippus. General observations in southern Ontario. [Canadian Field Nat.] 55: 123-129. **Bell & Comstock.**—The synonymy of Papilio coridon, Papilio phocion and others. [6] 49: 371-374. **Brower, A. E.**—A new species of Metalectra from eastern North America. (Phalaenid.). [1] 67: 271-274, ill. **Clark, A. H.**—Notes on some North and Middle American Danaid butterflies. [50] 90: 531-542, ill. **Clarke, J. F. G.**—The North American moths of the genus Arachnis, with one new species. [50] 91: 59-70, ill. Revision of the North American moths of the family Oecophoridae, with descriptions of new genera and species. [50] 90: 33-286, ill. **Floyd, E. H.** — Investigations on the biology and control of the alfalfa caterpillar, Colias eurytheme. [La. Acad. Sci.] 5: 31-32. **Janse, A. J. T.**—Contribution to the study of the Phycitinae. [Jour. Ent. Soc. So. Africa] 4: 134-166, ill. **Johnson & Comstock.** — Anaea of the Antilles and their continental relationships with descriptions of new species, subspecies and forms (Nymphalid.). [6] 49: 301-342, ill. **Lindsey, A. W.**—A new form of Hesperia colorado [7] 34: 770-772. **Nevskij, V.**—On the causes of fluctuations in population density of the codling moth (Cydia pomonella). [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 37: 14 pp. **Simpson, L. R.** — The buck moth. [Canadian Nature] 1942: 3, ill. **Wyatt, A. K.**—Collecting Heliothinae in 1940. [19] 36: 203-205.

DIPTERA.—Alexander, C. P.—Records and descriptions of neotropical crane-flies (Tipulid.). [6] 49: 345-356. New Nearctic crane-flies (Tipulid.). [4] 73: 206-213. **Barretto,**

M. P. — Morfologia dos ovos, das larvas e das pupas do Phlebotomus intermedius e neiva 1912 (Psychodidae). [An. Fac. Med. Univ. S. Paulo] 16: 91-105, ill. Observacoes sobre a biologia do Phlebotomus intermedius e neiva, 1912 (Psychodid.) em condicoes experimentais. [An. Fac. Med. Univ. S. Paulo] 16: 143-157 pp., ill. **Correa, M. L.** — La Quetotaxia de la larva de Anopheles occidentalis. [An. Esc. Nac. Cien. Biol., Mexico] 2: 217-238, ill. **Dampf, A.** — Mochlostyrax trifidus nuevo miembro de la fauna Culicidologica Mexicana. [An. Esc. Nac. Cien. Biol., Mexico] 2: 251-257, ill. **Dobzhansky & Spassky.**—Intersexes in Drosophila pseudoobscura. [119] 26: 556-562, ill. **Gordon & Sang.** — The relation between nutrition and exhibition of of the gene Antennaless (Drosophila melanogaster). [Proc. Royal Soc.] 130 (B): 151-184, ill. **Greene, C. T.**—A remarkable new species of the genus Pseudacteon (Phorid.). [10] 43: 183-184, ill. Two new species of cecidomyiid flies from Phlox. [50] 90: 547-551, ill. **Howell, T.**—Notes on Ephemeroptera and aquatic Diptera of western North Carolina. [Jour. E. Mitchell Sci. Soc.] 57: 306-317. **Hull, F. M.** — Some new species of the genus Baccha from the New World. [10] 43: 181-183. New American syrphid flies. [40] No. 1151: 3 pp. **James, M. T.** — New species and records of Mexican Stratiomyidae. [An. Esc. Nac. Cien. Biol., Mexico] 2: 241-249. **Johannsen, O. A.** — Occurrence of Orbellia hiemalis in Maine. [19] 36: 202. **Khodukin & Sternhold.**— On the resistance to cold of some Anopheles. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 45: 11 pp., ill. **Komp, W. H. W.**—The species of Nyssorhynchus confused under Tarsimaculatus goeldi, and a new name, A. emilianus, for one species found in Para, Brazil (Culicidae). [7] 34: 791-807, ill. **Philip, C. B.**—Notes on three western genera of flies (Tabanid.). [19] 36: 185-199. (*k). **Renn, C. E.**— The food economy of Anopheles quadrimaculatus and A. crucians larvae: relationships of the air-water interface and the surface-feeding mechanism. [Symposium on Hydrobiol.] 1941: 329-342, ill. **Rowe, J. A.**—Preliminary report on Iowa mosquitoes. [Iowa State Coll. Jour. Sci.] 16: 211-225. **Sabin & Ward.** — Flies as carriers of poliomyelitis virus in urban epidemics [68] 94: 590-591. **Sabrosky, C. W.** —An annotated list of genotypes of the Chloropidae of the World [7] 34: 735-765.

COLEOPTERA.—Austin & Richardson.—Ability of the firebrat to damage fabrics and paper. [6] 49: 357-365.

Blake, D. H.—New species of Chaetocnema and other Chrysomelids from the West Indies. [10] 43: 171-180, ill. **Chisholm, J. J.**—Combating the Japanese beetle. [Fauna] 3: 122-123, ill. **Elliott, D. C.**—The biology of the cottonwood leaf beetle Lina scripta. [La. Acad. Sci.] 5: 31. **Halilova, R.** — On the conditions resulting of poisoning Tribolium confusum. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 44: 14 pp. **Howard, N. F.** — Feeding of the Mexican bean beetle larva. [7] 34: 766-769, ill. **Khabirova, M.** — Some data concerning the bioecology of Sitophilus granarius. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 43: 14 pp. **Knull, J. N.**—New Coleoptera. (Buprestid. & Cerambycid.). [7] 34: 691-695, ill. Nine new Coleoptera (Plastoceridae, Buprestidae & Cerambycidae). [Ohio J. Sci.] 41: 381-388, ill. **Leech, H. B.** — The generic name Thermonectus (Dytiscid.). [4] 73: 197. **Leonova, N.** — Influence of external factors on the intestine fauna of Tribolium confusum. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 34: 12 pp. **Luginbill & Painter.**—A new species of Phyllophaga. [7] 34: 716-717, ill. **MacLeod, G. F.**—X-ray studies of starving mealworm larvae. [7] 34: 696-701, ill. **Malkin, B.**—An addition to the New York State List of Coleoptera No. 5. Long Island records. [19] 36: 209-212. **Pieltain, C. B.**—Estudio de la larva del Paratrechus (Hygroduvalius sylvaticus.) [121] 2: 208-209. **Saakian, A.** — Influence of temperature and carbon dioxide on the respiration intensity of Tribolium confusum. [Acta Univ. Asiae Med.] Ser. 8, (Zool.) fasc. 38: 15 pp. **Ward, I. J.**—The bean weevil, Acanthoscelides obtectus in stored white beans. [4] 73: 216.

HYMENOPTERA. — Balch, Reeks & Smith. — Separation of the European spruce sawfly in America from Gilpinia polytoma (Diprionid.) and evidence of its introduction. [4] 73: 198-203. **Bequaert, J.**—Gymnopolybia cayennensis introduced with bananas in Texas. A correction [19] 36: 205. **Chamberlin, T. R.**—The wheat jointworm in Oregon, with special reference to its dispersion, injury, and parasitization. [U. S. Dept. Agric.] Tech. Bull. No. 784: 47 pp., ill. **Gaul, A. T.** — Experiments on the taste sensitivity of Dolichovespula arenaria (Vespid.). [6] 49: 367-369. **Gemignani, E. V.** — Una nueva especie del genero Trypoxilon. [Rev. Soc. Ent. Argentina] 11: 42-44, ill. **Kloet, G. S.**—A new observation nest for wood boring Aculeates. [8] 77: 241-244, ill. **Lafleur, L. J.**—Tolerance in Ants. [90]

76: 85-93. The founding of Ant colonies. [92] 81: 392-401. **Lanham, U. N.** — Bees of the genus Andrena of Boulder, Colorado. [7] 34: 702-713. (k). **Muesebeck, C. F. W.** — A new ant parasite (Bracon) [19] 36: 200-201. **Smith, M. R.** —Two new species of Aphaenogaster (Formicid.). [Gt. Basin Naturalist]. 2: 118-121. **Walley, G. S.**—On the genus Petalodes, with descriptions of two new North American species (Braconid.). [4] 73: 213-215.

SPECIAL NOTICES.—Comity of Spiders. By W. S. Bristowe. Volume 2. 1941. 229-560 pp., ill. London. **Index to Farmers' Bulletins.** Nos. 1501-1750. By M. H. Doyle. 1941. 135 pp. **Index to Technical Bulletins.** Nos. 501-750 By M. H. Doyle. 1941. 169 pp. **Microbe's Challenge.** By F. Eberson. The Jaques Cattell Press, Lancaster, Pennsylvania. 1941. pp. VIII, 354. The role of insects in epidemics, plague, tularemia and virus diseases is discussed. **Natural History and the American Mind.** By W. M. & M. S. C. Smallwood. Columbia University Press, New York. 1941. pp. xiii, 445, ill. A brief section on "Entomology" in chapter XII, "The passing of the naturalist," deals with William Dandridge Peck, Thomas Say and Thaddeus William Harris, whose chief publications are listed in the bibliography near the end of the book. **New or Little-known Tipulidae** from eastern Asia. By C. P. Alexander. [Philippine Jour. Sci.] 76: 27-66, ill. (Reference made to some new North American species).

Colorado Lepidoptera Records (Pieridae, Noctuidae)

In 1936 I reported in this journal the occurrence of the South and Central American pierid, *Gonepteryx clorinde* (Godart), in Colorado. Another specimen has come to my attention but, in contrast to the frayed and rubbed condition of the other, collected in perfect condition. The specimen, a male, was collected by Howard Rollin a few miles north of Weldona, Colorado, about September 1, 1929, while feeding on Sultana.

A very badly frayed and rubbed specimen of the large noctuid moth, *Thysania zenobia* Cramer, was taken in Boulder, flying about theater lights on September 9, 1941. This is another neotropical species which occasionally strays far from its usual range, and has been found as far north as Maine.—Hugo G. Rodeck, University of Colorado Museum, Boulder, Colorado.

OBITUARY

Dr. JAMES ALLEN NELSON was born in Urbana, Ohio, April 29, 1875, and died at Gambier, Ohio, August 9, 1941. He attended Kenyon College, from which he was graduated in 1898 with the degree of Ph. B. He then attended the graduate school of the University of Pennsylvania from which institution he received the degree of Ph. D. in 1903, serving part of the time there as an assistant in Zoology. His thesis at Pennsylvania was on the cell lineage of a species of *Dinophilus* and later he described this species and named it *conklini*, after Professor E. G. Conklin under whom his thesis had been prepared. This was in the days when cell lineage was the biological style, and this paper served to place *Dinophilus*, which had been a matter of zoological dispute.

After receiving his degree, Nelson felt the need of more work on insects and spiders, so he accepted an honorary fellowship at Cornell University where he worked under the direction of Professor J. H. Comstock, especially on the palpi of male spiders. He remained at Cornell for four years.

His detailed methods of investigation seemed especially to fit him for some work then needed in the Bureau of Entomology, so in 1908 he was appointed to the bee culture office of that Bureau to investigate the embryology of the honeybee. The results of this excellent piece of work are published in book form by the Princeton Press.[1]. Later he described the anatomy of the larval honeybee[2] and either alone or in cooperation with others in the same office he investigated certain larval growth curves of scientific and practical value.[3]

---

[1] The Embryology of the Honey Bee. Princeton, October, 1915. Pp. vi, 282, 95 text figs. Reviewed in the NEWS for Jan., 1916, vol. 27: 41-43.

[2] Morphology of the Honey Bee Larva. Journ. Agric. Research, 28 (12): 1167-1213, 8 pls. 1924.

[3] Nelson, J. A., Sturtevant, A. P. and Lineburg, B. Growth and Feeding of Honey Bee Larvae. U. S. Dept. Agric. Bull. No. 1222. 37 pp. figs. 1924.

After ten years of service in the Bureau he resigned and went to Mt. Vernon, Ohio, to live. This relatively early retirement was brought about by poor health and the sad death of his only son. In Mt. Vernon he took keen interest in his garden which became a veritable show place, and he also renewed his earlier interest in music and became a highly skilled pianist. He did not again undertake any biological inquiries.

After a few years of residence in Mt. Vernon, Nelson moved to his old college community at Gambier where he spent his remaining years, a respected and useful member of the community, active in civic and church affairs and much interested in everything pertaining to the college for which he had such an affection. His death is a loss to his friends who have known him for so many years and must be an even keener loss to those with whom he had closer associations in later years. He is survived by his wife and a married daughter.

Nelson was a member of the A. A. A. S., the American Society of Zoologists, the American Association of Economic Entomologists, and Entomological Society of America and the Ohio Academy of Sciences, in all of which he took interest, even though in recent years he had not been able to attend meetings with regularity.—E. F. PHILLIPS.

We are indebted to Mr. Hugh B. Leech for the announcement of the deaths of Mr. RALPH HOPPING, veteran Coleopterist of the western United States and Canada, at 8 A. M., Wednesday, October 29, 1941, at his home in Vernon, British Columbia, and of Mr. F. C. HENNESSEY, artist for the Entomological Branch of the Canadian Department of Agriculture at Ottawa, on November 8, 1941. Ralph Hopping was born in New York City, April 8, 1868, but spent much of his life in the Sierras of California with the United States Forest Service (1907-1919). He went to British Columbia in December, 1919, to take charge of the Dominion Forest Insect Laboratory. His large collection, chiefly of Coleoptera, we believe, goes to his son, George R. Hopping, and eventually to the California Academy of Sciences at San Francisco.

Science for January 16, 1942, quoting *Nature*, records the death of Dr. H. ELTRINGHAM, president of the Royal Entomological Society of London in 1931-32, on November 26, at the age of 68 years. He was one of the secretaries of the 2nd International Congress of Entomology held at Oxford, England, in August, 1912.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Living specimens of the luminous beetle **Phengodes** this summer. E. Newton Harvey, The Biology Dept., Princeton University, Princeton, New Jersey.

Malacodermata (except Lycidae and Cleridae) of the world. Will determine and purchase. Also exchange against Col. or all other insects from Bolivia. Walter Wittmer, Correio 1043, Buenos Aires, Rep. Argentina.

I want to collect Rothschildia, agapema, gulfina and io moths and Texas butterflies for interested persons. Eula Frizzell, R 4 San Benito, Texas.

Wanted—To hear from collectors who desire extra good cocoons of Michigan **Platysamia columbia,** that will emerge June, 1941. W. S. McAlpine, 575 Townsend St., Birmngham, Michigan.

Wanted—Specimens of the genus Trox from North America. Will exchange or determine for duplicate material. Mark Robinson, 231 Cherry St., Sharon Hill, Pennsylvania.

Lepidoptera—From the South, including P. palamedes, T. halesus and E. jucunda to exchange for fauna from other localities. H. W. Eustis, Woodbine Rd., Lakemont, Augusta, Georgia.

Wanted—Egg cases of preying mantids. Correspondence desired with those who will collect. Osmond P. Breland, Department of Zoology, The University of Texas, Austin, Texas.

Wanted—To buy, specimens of bees of the genus **Nomada,** any quantity, especially North American. Quote price, locality. Hugo G. Rodeck, University of Colorado Museum, Boulder Colorado.

Arctic Lepidoptera especially **Noctuidae**—Wanted to hear from collectors who desire the Arctic Species. Have large collection. R. J. Fitch. Lloydminster, Saskatchewan, Canada.

NEW Scientific Publications of

THE READING PUBLIC MUSEUM AND ART GALLERY

READING, PENNSYLVANIA

No. 2.—NEW ITHOMIINAE (LEPIDOPTERA: NYMPHALIDAE), by R. M. Fox. 34 pages, 2 plates
No. 3.—REVISION OF THE GENUS SAIS HUBNER (LEPIDOPTERA: ITHOMIINAE), by R. F. d'Almeida and R. M. Fox. 5 pages, 1 plate
} $1.00

Please make all checks payable to THE READING PUBLIC MUSEUM

THE PAN-PACIFIC ENTOMOLOGIST

A quarterly journal of general entomology published by the Pacific Coast Entomological Society. It features insect problems of the Pacific area but is in no way confined to that region. The systematic and biological phases of entomology are stressed including articles on insect taxonomy, morphology, life history and distribution.

Subscription price $2.00 per yearly volume of about two hundred pages.

A few complete sets of the thirteen back volumes are still available at no increase in price.

Address: California Academy of Sciences
San Francisco, California

A Year of Costa Rican Natural History

By AMELIA SMITH CALVERT, Sometime Fellow in Biology, Bryn Mawr College, and PHILIP POWELL CALVERT, Emeritus Professor of Zoology, University of Pennsylvania, Editor of Entomological News.

Cloth, 8vo., pp. xix + 577. Frontispiece (of 14 species of insects in colors), 137 black and white illustrations, 5 maps. $3.00.

Written in non-technical language but recording many new observations. Notes on 250 species of insects (Orthoptera, Odonata, Neuroptera, Coleoptera, Hymenoptera, Lepidoptera, Diptera, Hemiptera), 56 figured; on Arachnids and other animals; on 230 species of plants (60 reproduced from photographs), on human life and manners, volcanoes, earthquakes and Costa Rica in general. Appendices on temperature and weather records, bibliographies on Costa Rica.

For Sale by

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 Race Street, Philadelphia, Pa.

REVISTA DE ENTOMOLOGIA

AN INTERNATIONAL REVIEW OF ENTOMOLOGY

An illustrated magazine published four times a year by **Thomaz Borgmeier, O.F.M.,** devoted to entomology, mainly of the neotropical fauna.

The volumes already published since 1931 comprise thousands of pages and contain articles by leading entomologists such as F. W. Edwards, W. Horn, E. Lindner, J. W. S. Macfie, E. Martini, A. da Costa Lima, F. Silvestri, C. Menozzi, A. Reichensperger, F. Santschi, J. D. Hood, etc., with a bibliography of the current literature (economic and non-economic) of the neotropical fauna.

Annual subscription $4.00 U. S. ($5.00 U. S. through booksellers). All payments are in advance. The back volumes are still on sale; price of each volume $4.00 U. S.; through booksellers $5.00 U. S.

Subscriptions should be sent to the Editor:

THOMAZ BORGMEIER, O. F. M.,

Convento S. Antonio, Largo da Carioca, Rio de Janeiro, Brazil.

MANUAL OF MYIOLOGY (IN TWELVE PARTS)

by Charles H. T. Townsend

Part I. Development and Structure. 1934. 275 pp.
Part II. Muscoid Classification and Habits. 1935. 280 pp. 9 pls.
Part III. Oestroid Classification and Habits. (Gymnosomatidae to Tachinidae). 1936. 249 pp.
Part IV. Oestroid Classification and Habits. (Dexiidae and Exoristidae). 1936. 303 pp.
Part V. Muscoid Generic Diagnoses and Data (Glossinini to Agriini). 1937. 232 pp.
Part VI. Muscoid Generic Diagnoses and Data (Stephanostomatini to Moriniini). 1938. 242 pp.
Part VII. Oestroid Generic Diagnoses and Data (Gymnosomatini to Stenostomatini). 1938. 427 pp.
Part VIII. Oestroid Generic Diagnoses and Data (Microtropezini toVoriini). 1939. 405 pp.
Part IX. Oestroid Generic Diagnoses and Data (Thelairini to Clythoini). 1939. 268 pp.
Part X. Oestroid Generic Diagnoses and Data (Anacamptomyiini to Frontinini). 1940. 334 pp.
Part XI Oestroid Generic Diagnoses and Data (Goniini to Trypoerini). 330 pp.

Prices and other information may be secured from:

CHARLES TOWNSEND & FILHOS,

Itaquaquecetuba, E. F. C. B., S. Paulo, Brazil.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

COLEOPTERA

1085.—**Robinson** (M.).—Studies in the Scarabaeidae of N. Am. II. (68: 127-136, ill., 1941) ..... .20

DIPTERA

1092.—**Fisher** (E. G.).—Distributional notes and keys to American Ditomyiinae, Diadocidiinae, and Ceroplatinae, with descr. of n. sps. (Mycetophilidae). (67: 275-301, 2 pls., 1941) ..... .60

1087.—**Richards** (A. G. Jr.).—Differentiation between toxic and suffocating effects of petroleum oils on larvae of the house mosquito (Cules pipiens). (67: 161-196, 5 pls., 1941) ..... .85

M-10—**Huckett** (H. C.).—A revision of the N. Am. sps. belonging to the gen. Pegomyia (Muscidae). (Mem. 10, 131 pp., 9 pls., 1941) 3.00

LEPIDOPTERA

1091.—**Brower** (A. E.).—A new sp. of Metalectra from eastern N. Am. (Phalaenidae). (67: 271-274, ill., 1941) ..... .15

NEUROPTERA

1084.—**Ross** (H. H.).—Descriptions and records of N. Am. Trichoptera. (67: 35-126, 13 pls., 1941) 2.00

ODONATA

1089.—**Needham** (J. G.).—Life history studies on Progomphus and its nearest allies (Aeschnidae). (67: 221-245, ill., 1 pl., 1941) ..... .50

ORTHOPTERA

1088.—**Hebard** (M.).—The group Pterophyllae as found in the U. S. (Tettigoniidae). (67: 197-219, 2 pls., 1941) ..... .50

1086.—**Rehn** (J. A. G.).—On new and previously known sps. of Pneumoridae (Acridoidea). (67: 137-159, ill., 1941) .. .45

1090.—**Rehn** (J. A. G.).—Notes on and records and descr. of Oriental bird-locusts (Acrididae). (67: 247-270, 2 pls., 1941) ..... .55

1083.—**Roberts** (H. R.).—Nomenclature in the Orthoptera concerning genotype designations. (67: 1-34, 1941) ..... .65

1093.—**Uvarov** (B. P.).—New and less known southern Palaearctic Orthoptera. (67: 303-361, 5 pls., 1942) 1.25